What is claimed is:

1. An optical radiation sensor device for detecting radiation in a radiation field having a thickness, the device comprising:

a radiation source;

a radiation sensor element positioned to receive radiation from the radiation source; and

motive means to alter the thickness of the radiation field from a first thickness to a second thickness;

the sensor element capable of detecting and responding to incident radiation from radiation source at the first thickness and at the second thickness.

2. The optical sensor device defined in claim 1, wherein the thickness is defined by a distance between the radiation source and the radiation sensor.

3. The optical sensor device defined in claim 2, wherein the motive means alters the relative distance between the radiation source and the radiation sensor from a first distance to a second distance.

4. The optical sensor device defined in claim 2, wherein the radiation source is stationary and the motive means moves the sensor element.

5. The optical sensor device defined in claim 2, wherein the sensor element is stationary and the motive means moves the radiation source.

6. The optical sensor device defined in claim 2, wherein the motive means alters the relative linear distance between the radiation source and the radiation sensor.

7. The optical sensor device defined in claim 1, wherein the thickness is defined by a

distance between a boundary element and the radiation source

8. The optical sensor device defined in claim 7, wherein the motive means alters the relative distance between the boundary element and the radiation source from a first distance to a second distance.

9. The optical sensor device defined in claim 7, wherein the radiation source is stationary and the motive means moves the boundary element.

10. The optical sensor device defined in claim 7, wherein the boundary element is stationary and the motive means moves the radiation source.

11. The optical sensor device defined in claim 7, wherein the motive means alters the relative linear distance between the boundary element and the radiation source.

12. The optical sensor device defined in claim 7, wherein the sensor element is stationary.

13. The optical sensor device defined in claim 1, wherein the motive means alters the thickness of the radiation field in a step-wise manner.

14. The optical sensor device defined in claim 1, wherein the motive means alters the thickness of the radiation field in a continuous manner.

15. The optical sensor device defined in claim 1, wherein the device is submersible in a fluid of interest.

16. The optical sensor device defined in claim 1, wherein the device is submersible in a liquid of interest.

17. The optical sensor device defined in claim 1, wherein the device is submersible in water.

18. A radiation source module comprising the optical sensor device defined in claim 1.

19. A fluid treatment system comprising the optical sensor device defined in claim 1.

20. A water treatment system comprising the optical sensor device defined in claim 1.

21. A water disinfection system comprising the optical sensor device defined in claim 1.

22. A process for measuring transmittance of a fluid in a radiation field, the process comprising the steps of:

(i) positioning a radiation source and a radiation sensor element in a spaced relationship to define a first thickness of fluid in the radiation field;

(ii) detecting a first radiation intensity corresponding to radiation received by the sensor element at the first thickness;

(iii) altering the first thickness to define a second thickness;

(iv) detecting a second radiation intensity corresponding to radiation received by the sensor element at the second thickness; and

(v) calculating radiation transmittance of the fluid in the radiation field from the first radiation intensity and the second radiation intensity.

23. The process defined in claim 22, wherein Step (iii) comprises altering the relative distance between the radiation source and the radiation sensor from a first distance corresponding to the first thickness to a second distance corresponding to the second

distance.

24. The process defined in claim 22, wherein Step (iii) comprises moving the sensor element while keeping the radiation source stationary.

25. The process defined in claim 22, wherein Step (iii) comprises moving the radiation source while keeping the sensor element stationary.

26. The process defined in claim 23, wherein Step (iii) comprises altering the relative linear distance between the radiation source and the radiation sensor.

27. The process defined in claim 22, wherein Step (i) comprises interposing a boundary element between the sensor element and the radiation source to define the first thickness between the boundary element and the radiation source

28. The process defined in claim 27, wherein Step (iii) comprises altering the relative distance between the boundary element and the radiation source from a first distance corresponding to the first thickness to a second distance corresponding to the second distance.

29. The process defined in claim 27, wherein Step (iii) comprises moving the boundary element while keeping the radiation source stationary.

30. The process defined in claim 27, wherein Step (iii) comprises moving the radiation source while keeping the boundary element stationary.

31. The process defined in claim 27, wherein Step (iii) comprises altering the relative linear distance between the radiation source and the radiation sensor.

32. The process defined in claim 27, wherein the sensor element is stationary.

33. The process defined in claim 27, wherein Step (iii) comprises altering the first thickness of the radiation field in a step-wise manner.

34. The process defined in claim 27, wherein Step (iii) comprises altering the first thickness of the radiation field in a continuous manner.

35. An optical radiation sensor device for detecting radiation in a radiation field generated in a fluid of interest, the device comprising:

a radiation source submersible in the fluid of interest;

a submersible first radiation sensor element positioned in the fluid of interest at a first distance from the radiation source; and

a submersible second radiation sensor element positioned in the fluid of interest at a second distance from the radiation source;

wherein: (i) the first distance is different from the second distance, (ii) the first radiation sensor element is capable of detecting and responding to incident radiation from radiation source at the first distance, and (iii) the second radiation sensor element is capable of detecting and responding to incident radiation from radiation source at the second distance.

36. A radiation source module comprising the optical sensor device defined in claim 35.

37. A fluid treatment system comprising the optical sensor device defined in claim 35.

38. A water treatment system comprising the optical sensor device defined in claim 5.

39. A water disinfection system comprising the optical sensor device defined in claim 35.